edge of the candle, just under the wick, in order to conduct away and diffuse through itself the vibrations of heat. At first I had a series of these metallic collars, and proposed to remove them as the candle burned down; but I afterwards found that one or two good thick zinc collars would be sufficient.

Here is a candle from my cigar blow-pipe case which I am at present using, and another unused one, as made for me by Price & Co. of Battersea.

(4) CANDLE SCISSORS.

In Plattner's apparatus scissors are supplied for cutting the lamp-wick, which of course can also be used for other purposes, *and also* a pair of pliers for squeezing the wick together, and pressing it in any direction; these latter cannot be used, from the dirty state into which they get, for anything else. I use these two articles combined into one—*i. e.*, a pair of ordinary scissors with knobs at the end. This also goes into my cigar blow-pipe-case.

(5) ORDINARY WATCHMAKER'S PLIERS,

with a piece of wire-strapping round them, to enable them to act as holders of platinum wire supports, and they also act as the best cleaners of the wire by drawing the latter from between the pressed flat sides.

(6) TWO AGATE SLABS FOR GRINDING POWDERS.

I have here got instead, a small Freiberg agate mortar, with a pestle made from an agate pen, as I had no slabs small enough to pack away in this cigar-case.

(7) REAGENTS. BORIC ACID.

It has always seemed to me as though blow-pipe workers, or, as I call them, "Pyrologists," could no more profess to begin analytical operations by using a *salt* as reagent, than the analytical chemist could say he intended to begin his solution-work by using sodium nitrate instead of nitric acid. By employing boric acid instead of borax, therefore, in 1869, I at once obtained a series of new, very pretty, and important reactions, especially in the case of the alkaline earths, which formerly used to be the weakest part of blowpipe analysis; now, they are one of the easiest. Space and time do not allow me to describe these reactions here; and, unfortunately, I have brought no boric acid with me here in order to illustrate them; but here is a little German-silver cigar-light box in which the acid is kept, as it does not thus deteriorate. This also goes into the cigar-case.

Phosphoric acid is another of my new reagents (when I say "new," I mean that they are now 12 years old, but new in the sense that they have not been as yet generally adopted.) I use it instead of the old reagent "microcosmic salt." It affords, with several oxides before the blowpipe, new and interesting colors, as in the case of cobalt oxide, which imparts to it a very fine and pure violet instead of the ordinary blue. Of course, when a sufficient quantity of soda to form metaphosphate of sodium, or microcosmic salt after the ammonia has been driven off, has been added, the bead becomes blue, and this fact enables it to be used as an alkalimeter. It is the only reagent which requires to be kept in a stoppered bottle; and is such a powerful acid before the blowpipe that gold leaf is rapidly dissolved in it, yielding a brilliant purple bead. It affords, with iron oxide, a bead the color of watery blood. This ends the list of things packed in the cigar-case.

(8) A COMPASS IN WHICH THE NEEDLE POINTS E. AND W.

This is made by bending an ordinary magnetized needle in the centre until the points are opposite, like a lady's hairpin. It is, in fact, an ordinary horseshoe-magnet suspended, and such a magnet suspended swings E. and W. for a very obvious reason. It might prove useful in Arctic voyages, as such a needle would probably possess little or no "dip." If you bend an ordinarily magnetized needle at a right or any other angle, and suspend it from or on its centre of gravity, a line bisecting the angle will point E. and W., and it was such a needle I first made in order to find a very delicate test for traces of iron in ores. The more open or obtuse the angle, the more delicate this test is. I call it the "Equatorial Needle.' With a right-angled equatorial needle you can detect the mere trace of iron in the ore *Molybdenite*.

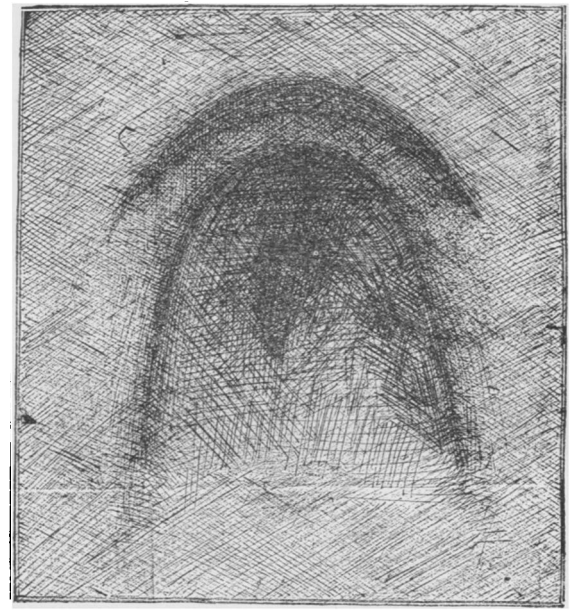
(9) AN ALLOY-BUTTON OF GOLD AND SILVER IN WHICH THESE METALS HAVE BEEN PARTLY SEPARATED BY THE BLOWPIPE ALONE.

Many years ago I found that, if you heat an alloy of two or more metals very gently with the blowpipe, so as not to promote fusion, in which case the ball spins round, and all the component metals are mixed again—that one nearly pure metal invariably leaves the others, and approaches the source of heat. This is a case of gold and silver alloy, in which the silver has approached the source of heat, but the process can be admirably illustrated in the case of a common bronze pin, in which the tin approaches the source of heat, while the copper remains in the background. Such a process might obviously be found useful in metallurgy on the large scale.

ASTRONOMY.

To the Editor of "SCIENCE."

On the early morning of June 30, 1881, the definition was very good. On no other occasion was *Comet B*, 1881, seen so clearly. As it appeared in our 8¼-inch refractor, it presented some peculiarities which I have not noticed in any published drawings, and therefore mail you the enclosed.



The prominent features were an unsymmetrical pear shaped coma surrounding the nucleus, two streams on either side, and one directly opposite the tail, which blended with the envelope. Around the whole was a very faint secondary envelope.

Very respectfully,

ISAAC SHARPLESS.

HAVERFORD COLLEGE OBSERVATORY, *September* 1, 1881.